Remarks

Claims 1-14 and 20 are pending in the application, of which claims 1 and 20 are in independent form. The subject matter of amended claims 1 and 10 is encompassed within the scope of the original claims and should, therefore, not raise new issues that would require further consideration or searching.

Applicants thank Examiner Tran for the courtesies extended to Applicant's attorney, Sandra K. Szczerbicki, during a telephone interview on March 4, 2005.

Claims 1-14 and 20 stand rejected under 35 U.S.C. § 102(b) for anticipation by U.S. Patent No. 4,134,863 to Fanta et al. ("Fanta") and by U.S. Patent No. 4,323,487 to Jones et al. ("Jones") for substantially the same reasons stated in the August 18, 2004 Office action. As stated by Examiner Tran, "[a]pplicants contend that neither Fanta nor Jones teaches an absorbent composition in granular form" (January 11, 2005 Office action, page 4). However, Examiner Tran states that "Fanta and Jones do teach granularizing of the absorbent copolymer" (Id.).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. Applicants submit that neither Fanta nor Jones describes all of the elements of independent claim 1. Specifically, applicants assert that neither Fanta nor Jones describes "granularizing the precipitated starch graft copolymer to form granules of superabsorbent polymer product sized for use in agricultural applications," as recited in amended claim 1 of the application.

Briefly, applicants address the terms "granularization" and "granules." Granularization is a distinct process whose use is not described in either of the cited prior art references. As described in the present application, various exemplary processes can be used to effect granularization, including, but not limited to, the following: die-shaping (paragraphs [0011] and [0024]); pelletization (paragraph [0013]); in-line chopping (paragraph [0022]); hand-chopping (paragraph [0023]); extrusion (paragraph [0027]); acid-base precipitation (paragraph [0027]); and Cowles dispersion (paragraph [0043]). Granules have sufficient bulk density and size to permit their use in agriculture (*see* paragraphs [0004] and [0014]).

Regarding Fanta, applicants contend that Fanta does not disclose "granularizing the precipitated starch graft copolymer to form granules of superabsorbent polymer product sized for use in agricultural applications," as recited in amended claim 1 (emphasis added). The Examiner equates Fanta's disclosure of Wiley-milling a starch graft copolymer with granularizing a starch graft copolymer to form granules. Applicants respectfully assert

that Examiner Tran is incorrect. To support this assertion, applicants submit a 37 C.F.R. § 1.132 Declaration of Dr. William M. Doane ("Declaration"). As stated in paragraphs 1 and 9 of the Declaration, Dr. Doane is "an inventor named in the above-identified patent application" and "an inventor named in Fanta." Thus Dr. Doane has firsthand knowledge of the differences between the two inventions.

As stated in paragraph 22 of the Declaration, "[i]t is impossible to form granules of starch graft copolymer by Wiley-milling films of a dried, saponified product. A Wiley mill includes several razor-sharp blades that are attached to a hollow cylinder that rotates around a central shaft. In Fanta, dried starch graft copolymer films are fed into the Wiley mill such that they come into contact with the razor-sharp blades. Consequently, the size of the films is reduced. Reduction in film size does not make 'granules of superabsorbent polymer product sized for use in agricultural applications,' as recited in amended claim 1. Rather, reduction in film size only makes smaller-sized films."

Because Fanta does not describe "granularizing the precipitated starch graft copolymer to form granules of superabsorbent polymer product sized for use in agricultural applications," as recited in amended claim 1 of the above-identified application (emphasis added), Fanta does not anticipate claims 1-14 and 20 of the above-identified application.

Regarding Jones, applicants contend that Jones does not disclose "granularizing the precipitated starch graft copolymer to form granules of superabsorbent polymer product sized for use in agricultural applications," as recited in amended claim 1 (emphasis added). Examiner Tran (1) equates Jones' disclosure of forming a starch graft copolymer powder with granularizing a starch graft copolymer to form granules and (2) opines that Jones' reference to a "dry granular form of hydrolyzed starch polyacrylonitrile graft copolymer" (col. 4, lines 11-13) anticipates claims 1-14 and 20 of the present application.

Applicants disagree with Examiner Tran's assertion that forming a superabsorbent polymer product in the form of a powder is the same as forming "granules of superabsorbent polymer product." As stated in paragraph 0004 of the present application, "[o]ne inherent limitation of finer-mesh particles is that they cannot be used in typical granule applicators which require particle sizes of at least 25 mesh. Further, the SAP films and powders cannot be applied with granular fertilizers, granular pesticides, or other granular agricultural additives." Further, as stated in paragraph 25 of the Declaration, granules of superabsorbent polymer "have an increased bulk density that facilitates their transport and their application to a growth substrate." Lastly, applicants have amended

claim 1 to recite "granules of superabsorbent polymer product sized for use in agricultural applications."

Regarding Examiner Tran's assertion that Jones' reference to a "dry granular form of hydrolyzed starch polyacrylonitrile graft copolymer" (col. 4, lines 11-13) anticipates claims 1-14 and 20 of the present application, applicants refer to the Declaration. Dr. Doane was "the Research Leader at the ARS National Center for Agricultural Utilization Research while the inventors listed in Jones conducted their research." (Declaration at paragraph 27). "Thus [Dr. Doane is] intimately familiar with the absorbent starch graft polymers described in Jones." (Declaration at paragraph 27). In his Declaration, Dr. Doane states that "the listed inventors of Jones did not make or have in their possession at the time of filing of the Jones patent application a granular starch graft copolymer. This is so because, at that time, no method of forming a granular starch graft copolymer was known in the art." (Declaration at paragraph 30).

Moreover, Dr. Doane states that "the disclosure of a 'dry granular form of hydrolyzed starch polyacrylonitrile graft copolymer' in Jones is not enabled." (Declaration at paragraph 31). Specifically, Jones does not disclose a method of or process for forming the described "dry granular form of hydrolyzed starch polyacrylonitrile graft copolymer." Instead, Jones states that "[t]he . . . details of preparing hydrolyzed starch polyacrylonitrile graft copolymer are well known in the art." (col. 2, lines 62-64). Dr. Doane, one of skill in the art, states that, at the time of filing of the Jones patent application, no method of forming granules of precipitated starch graft copolymer was known in the art. (Declaration at paragraph 30). Thus the formation of granules of superabsorbent polymer product was not "well known in the art." Further, Jones states that the formation of "large granular material is not always feasible" (col. 2, lines 11-12).

Additionally, applicants have amended independent claim 1 to recite "granules of superabsorbent polymer product sized for use in agricultural applications" (emphasis added). Applicants contend that the starch graft copolymers described in Fanta and Jones cannot be used for agricultural applications. Regarding Fanta, the absorbent composition described therein is used "for the entrapment and immobilization of enzymes" (col. 8, lines 2-3). Fanta contains no description or suggestion of use of the absorbent composition for agricultural purposes. Also, as discussed above, Fanta discloses the formation of films of starch graft copolymer. Films of superabsorbent polymer product cannot be used in agriculture for a variety of reasons, including that they (1) cannot be applied with granular fertilizers, granular pesticides, or other granular agricultural

additives" (paragraph [0004] of present application) and (2) are typically blown away by any wind present during their application to a growth substrate because of their lack of sufficient bulk density. Regarding Jones, the superabsorbent polymer to which formaldehyde is added is not described as being appropriate for use "in agricultural applications." Further, as stated in the October 14, 2004 Response to the first Office action, "the cross-linked superabsorbent polymer taught by Jones cannot be successfully used in agricultural applications."

Because neither Jones nor Fanta sets forth each and every element of amended independent claim 1 and independent claim 20, applicants believe that neither reference anticipates these claims or amended claim 1's dependent claims. Applicants request, therefore, that the anticipation rejection of independent claims 1 and 20 and dependent claims 2-14 be withdrawn.

Dependent claims 2-14 stand rejected for anticipation. Applicants choose to rely on the arguments presented above with respect to amended independent claim 1 to support the patentability of the rejected dependent claims.

Independent claim 20 recites "[a] superabsorbent polymer product for use in agricultural applications made in accordance with the method of claim 1." Thus the above arguments made with reference to amended independent claim 1 apply to independent claim 20.

Applicants believe the application is in condition for allowance and respectfully requests the same. Applicants invite the Examiner to contact the undersigned by telephone, in the event that the Examiner believes there are any issues outstanding.

Respectfully submitted,

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